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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

GROUP 3600

Application Number: 10/624,987
Filing Date: July 22, 2003
Appellant(s): HOFMEISTER ET AL.

Janik Marcovici
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 9, 2007 appealing from the Office
action mailed April 5, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is substantially correct. In addition, the April 9, 2007 amendment has been entered for purposes of appeal.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 5,700,127 to Harada et al.

US 2002/0150448 to Mizokawa et al.

US 2002/0061248 to Tepman

US 2002/0044860 to Hayashi et al.

US 5,641,054 to Mori et al.

(9) Grounds of Rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5-10, 13, 15-38 & 40-42 rejected under 35 U.S.C. 102(e) as being anticipated by Mizokawa et al. (US 2002/0150448).

With respect to claim 1, referring to FIGS. 1-10 Mizokawa et al. disclose a substrate processing apparatus 2 having a transport chamber 14, linear slot 11, holding modules 4 located on one side of slot 11 and connected to transport chamber 14, another module A, B, C, D connected to transport chamber 14, and transport vehicle 13 having base 12, 13, and arm 45.

With respect to claim 5, referring to FIGS. 1-10 Mizokawa et al. disclose another module A, B, C, D connected to transport chamber 14. Page 2, para. 0031, Ins. 6-7.

With respect to claim 6, referring to FIGS. 1-10 Mizokawa et al. disclose a transport chamber 14 connecting holding module 4 with other module A-D.

With respect to claim 7, referring to FIGS. 1-10 Mizokawa et al. disclose a rotatable arm 45 for transport vehicle 13.

With respect to claim 8, referring to FIGS. 1-10 Mizokawa et al. disclose a linear motor 12,41,43 for driving transport vehicle 13.

With respect to claim 9, referring to FIGS. 1-10 Mizokawa et al. disclose an electric motor 12,41,43 connected to a directionally articulating arm 45.

With respect to claim 10, referring to FIGS. 1-10 Mizokawa et al. disclose a substrate processing apparatus 2 comprising a transport chamber 14 with openings 16A, 16B, 16C, 16D, processing module A, B, C, D, module 4 for holding substrate, transport vehicle 13, base 12,13, arm 45 for transferring substrate from transfer chamber 14 and processing module A-D. Page 3, para. 0035, Ins. 6-8.

With respect to claim 13, referring to FIGS. 1-10 Mizokawa et al. disclose a tubular transport chamber 14. It is noted that "tubular", of or relating to a tube, defines a tunnel. The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company.

With respect to claim 15, referring to FIG. 4 Mizokawa et al. disclose a tubular transport chamber 14 where module 4 is connected to transport chamber 14 side.

With respect to claim 16, referring to FIG. 4 Mizokawa et al. disclose base 12,13 interacting with transport chamber 14 wall to movably support the transport vehicle 13.

With respect to claim 17, referring to FIGS. 5,7 Mizokawa et al. disclose a linear motor 12,41,43 connected to transport chamber 14 that drives transport vehicle 13 and for movement of arm 45.

With respect to claim 18, referring to FIGS. 1-10 Mizokawa et al. disclose a solid state motor 12,41,43. Page 3, para. 0036, Ins. 17-18.

With respect to claim 19, referring to FIGS. 1-10 Mizokawa et al. disclose a linear motor 12, 41, 43 that extends along a portion of the transport chamber 14 and a least a portion of other module 4.

With respect to claim 20, referring to FIGS. 1-10 Mizokawa et al. disclose a semiconductor workpiece processing apparatus 2 comprising a first chamber 14, transport vehicle 13, base 12,13, arm 45, another chamber A, B, C, D connected to first chamber 14 through openings 16A,16B,16C,16D creating a first chamber environment, page 2, para. 0032, Ins. 8-9.

With respect to claim 21, referring to FIGS. 1-10 Mizokawa et al. disclose an opening 16A, 16B, 16C in transport chamber 14. It is noted that Mizokawa et al. do not prescribe an opening less door where an environment separate from processing chamber A, B, C, D necessitates sealing said environment.

With respect to claim 22, referring to FIGS. 1-10 Mizokawa et al. disclose an apparatus wherein transport chamber 14 has an isolated environment separate from that of other chamber A, B, C, D. Page 2, para. 0032, Ins. 8-9.

With respect to claim 23, referring to FIGS. 1-10 Mizokawa et al. disclose a tubular first chamber 14 and a linear travel path 11. It is noted that "tubular", of or relating to a tube, defines a tunnel. The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company. Other chamber A, B, C, D is/are connected to lateral sides of first chamber 14.

With respect to claim 24, referring to FIGS. 1-10 Mizokawa et al. disclose for transport vehicle 13 a path defined by first chamber 14 and other chamber A-D.

With respect to claim 25, referring to FIGS. 1-10 Mizokawa et al. disclose a first chamber 14 environment, page 2, para. 0032, Ins. 8-9, different than other chambers A-D.

With respect to claim 26, referring to FIGS. 1-10 Mizokawa et al. disclose a tube shaped first chamber 14 with sides and a other chamber A, B, C, D, connected to first chamber 14 lateral sides.

With respect to claim 27, referring to FIGS. 5,7 Mizokawa et al. disclose a base 12, 13 interacting with at least one wall of first chamber 14 to support transport vehicle 13 from first chamber 14.

With respect to claim 28, referring to FIGS. 1-10 Mizokawa et al. disclose a linear motor 12,41,43 connected to first chamber 14 and for multi-axis movement of arm 45.

With respect to claim 29, referring to FIGS. 5,7 Mizokawa et al. disclose a linear motor 12, 41, 43 extending in first chamber 14 and other chamber A, B, C, D.

With respect to claim 30, referring to FIGS. 5,7 Mizokawa et al. disclose a linear motor 12, 41, 43 with a forcer component 41 and a reactive component 42.

With respect to claim 31, referring to FIGS. 1-10 Mizokawa et al. disclose a reactive component 42 on transport vehicle 13 and a force component 41 for supporting transport vehicle 13 in first chamber 14.

With respect to claim 32, referring to FIGS. 1-10 Mizokawa et al. disclose an arm 45 and end effector 45a for moving substrate. Page 3, para. 0035, Ins. 6-8.

With respect to claim 33, referring to FIGS. 1-10 Mizokawa et al. disclose a circular moving arm 45.

With respect to claim 34, referring to FIGS. 1-10 Mizokawa et al. disclose another processing module A, B, C, D, attached to first chamber 14.

With respect to claim 35, referring to FIGS. 1-10 Mizokawa et al. disclose another chamber A, B, C, D processing chamber. Page 2, para. 0031, Ins. 6-7. Moreover, while Mizokawa et al. does not prescribe so lithography, metal deposition, etching, and/or heating/cooling modules are common to the art of substrate processing.

With respect to claim 36, referring to FIGS. 1-10 Mizokawa et al. disclose a stocker 4.

With respect to claim 37, referring to FIGS. 1-10 Mizokawa et al. disclose a load lock 4.

With respect to claim 38, referring to FIGS. 1-10 Mizokawa et al. disclose an interface 16A, 16B, 16C, 16D between the front end module A,B,C,D, first chamber 14.

With respect to claim 40, referring to FIG. 9 Mizokawa et al. disclose a substrate processing apparatus 2 comprising a transport chamber 14 with several paths 11AM, 11NZ, holding module 4, first transport vehicle 12A with arm 45 and second transport vehicle 12B with arm 45.

With respect to claim 41, referring to FIG. 9 Mizokawa et al. disclose alignment of the travel paths 11AM, 11NZ.

With respect to claim 42, referring to FIG. 9 Mizokawa et al. disclose travel paths 11AM, 11NZ that extend lengthwise.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizokawa et al. (US 2002/0150448) in view of Harada et al. (US 5,700,127). Mizokawa et al. do not disclose load lock chambers. Harada et al. disclose either a substrate processing chamber 481 and load lock chamber module 483, or a load lock chamber module 484 and load lock chamber module 485, or a substrate processing chamber 481 and another substrate processing chamber 482. Harada et al. teach multiple load locks and substrate processing chambers to provide an exchanging stage 483-485 between substrate processing/holding module 481 and substrate processing/holding module 482. Col. 15, Ins. 28-50. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Mizokawa et al. to include load lock chambers and substrate processing chambers, as per the teachings of Harada et al., to provide an exchanging stage between substrate processing/holding module 481 and substrate processing/holding module.

Claims 11-12, 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizokawa et al. (US 2002/0150448) in view of Tepman (US 2002/0061248).

With respect to claim 11 & 21, referring to FIGS. 1-10 Mizokawa et al. disclose an opening 16A, 16B, 16C in transport chamber 14. Mizokawa et al. discloses closable openings but does not disclose doors. Tepman discloses closing an opening 238 with a door 292 to provide vacuum sealing of the load lock chamber 230. Para. [0027].

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the closable opening of Mizokawa to include a door, as per the teachings of Tepman, to provide vacuum sealing of a load lock chamber 230.

With respect to claim 12, referring to FIGS. 1-10 Mizokawa et al. disclose an apparatus wherein transport chamber 14 has an isolated environment. Page 2, para. [0032], Ins. 8-9.

With respect to claim 14, referring to FIGS. 1-10 Mizokawa et al. disclose a transport chamber 14 with environment. Page 2, para. 0032, Ins. 8-9.

(10) Response to Argument

A. 35 U.S.C. 112, Second Paragraph.

Claim 1

"A holding module" is not previously recited within claim 1. Line 5 recites the limitation "at least one substrate holding module" and line 14 recites the limitation "another module". "The at least one holding module" in line 18 may refer to the former or the latter, but applicants confusing choice of words could be construed as either. Claim 1 may require two substrate holding modules or two "other modules", but its not clear which Applicant intends as the invention.

Claim 10

With respect to claim 10, lines 20 and 26, it is unclear whether "reach" refers to the reach of a transport vehicle base or the reach of a transport vehicle transfer arm. Because of the grammar structure reach appears after "base". A base inherently has a reach because it moves along a transport path repositioning an arm at various access positions. But, this conflicts with Applicants specification which defines an arm having a reach. Thus, the multiple definitions of "reach" coupled with the contradictory specification is confusing when defining the boundary of the invention as recited in claim 10.

Claim 14

As noted under claim 1 arguments above, claim 1 recites at least two modules: "at least one substrate holding module" in line 5 and "another module" in line 14. Claim 14, line 3 recites "the other module", but this does not clearly match either of the earlier recitations including "module". Thus, claim 14 is indefinite for lack of antecedent basis.

Claim 16

Applicants arguments with respect to an amendment filed Dec. 7, 2005 correcting the 112, second paragraph rejection are irrelevant because the Dec. 7, 2005 amendment was not entered. The rejection stands as is repeated here. In support, "the first chamber" does not appear in claim 10. Claim 10 does recite "at least one processing module" and "another module", but does not recite "a first module". Thus, "the first chamber" in claim 16, line 3 lacks proper antecedent basis.

B. 35 U.S.C. 102.

Claims 1, 10, 20 & 22

The cited prior art discloses each and every limitation of claims 1, 10, 20 & 22. Applicant argues that Mizokawa does not disclose a transfer chamber holding an isolated atmosphere. First, an "atmosphere" includes any combination of characteristics including air pressure, wind, air purity, air particulate, humidity, dew point and/or temperatures. And, "isolated" is separate from. Mizokawa's discloses a transport chamber (or first chamber) having walls 15a-b and doors that cover openings 16 in said walls to isolate the interior chamber. Mizokawa discloses an isolated transfer chamber into which filtered air is injected to create a clean atmosphere different from that external to the chamber.

On page 11, lines 4-6 and page 22, line 9 Applicants specification defines "clean" as one type of environment. And Mizokawa at least discloses a clean, albeit different, atmosphere because Mizokawa discloses increased air pressure by virtue of having air inlets larger than air outlet, i.e. to develop back pressure to inhibit infiltration of contaminating air particulate. Applicants arguments with respect to openings is irrelevant as the mere presence of openings alone does not mean that Mizokawa's atmosphere is not clean. In fact, Mizokawa's discloses closable openings 16 which inherently would enhance the cleanliness of the atmosphere within the transfer chamber.

In other words, Mizokawa solves the problem of creating an atmosphere in an enclosed chamber, which Applicant now seeks to reclaim. Mizokawa discloses holding a clean air atmosphere because Mizokawa discloses a transport chamber having walls

and a fan/filter to input clean air atmosphere. Further, with reference to para. [0009] Mizokawa discloses a minimum chamber width or minimum transfer opening to reduce overall equipment size in the interests of production needs and equipment and production costs. Mizokawa discloses a transfer chamber having an isolated atmosphere. Thus, the cited prior art discloses each and every limitation of claims 1, 10, 20 & 22.

Claims 9 & 28

The cited prior art discloses each and every limitation of claims 9 & 28. Applicant argues that Mizokawa does not disclose a linear motor attached to and for moving of a transport vehicle transfer arm. With reference to Mizokawa para [0033-0034], Mizokawa discloses a linear transfer motor providing power to a transport vehicle 41, transport vehicle base, and transport vehicle transfer arm. The application of power to a transport vehicle is an application of power to those elements comprising a transport vehicle, i.e. a transfer arm and base. A linear transfer motor providing power to a transport vehicle drives a transfer arm. And, Mizokawa's discloses a motor and transfer robot unitized into one structure. Mizokawa's motor inherently powers the transfer robot. Thus, the cited prior art discloses each and every limitation of claims 1, 10, 20 & 22.

Claim 17

With respect to claim 17, Applicant argues that Mizokawa does not disclose a multi-axially movable arm. Referring to FIG. 2, Mizokawa's robot 2 discloses at least two axes, a vertical axis extending through the robot main body and another axis extending vertically through an elbow joint. Mizokawa's two axes are comprised by transport

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vehicle travel horizontally and vertically as well as a travel path of the transport vehicle transfer arm. Further, Mizokawa discloses a radial axis of an end effector as well as an additional radial axis of an end effector relative to a transport vehicle base. Mizokawa discloses at least four axis of movement. Thus, the cited prior art discloses the limitations of claim 17.

Claim 30

With respect to claim 30, Mizokawa's forcer component 41 is isolated as it is not part of the first chamber construction. FIG. 4 discloses a first chamber comprising alls 15a, 15b. The forcer component 41 does not attach or connect to in any way any of the first chamber walls. Thus, the forcer component is isolated from the first chamber.

Claim 31

With respect to claim 31, referring to FIGS. 1-10 Mizokawa et al. disclose a reactive component 42 on transport vehicle 13 and a force component 41 for supporting transport vehicle 13 connected to a first chamber vertical wall 15b. The first chamber comprises vertical walls 15a,b and a floor to which the forcer component 41 is connected. As the first chamber is unitized structure, the forcer component is connected to a vertical wall because it is connected to the first chamber. Thus, Mizokawa's forcer component is connected to a first chamber vertical wall.

Claim 40

With respect to claim 40, applicant argues Mizokawa does not disclose linear travel paths between opposing walls. "Between" means linear travel paths which are physically present and occur within a transport chamber. Mizokawa discloses linear

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travel paths which stretch from chamber wall to chamber wall because that is the reach of the robot arm 45. Mizokawa's discloses multiple linear travel paths (FIG. 9: 11NZ, 11AM; FIGS. 10: 12AM, 12NZ) which are within a transport chamber and bounded by transport chamber walls on each end of the travel path. Thus, the travel paths are between transport chamber walls. In addition, as noted above a transport vehicle has a linear travel path as defined by an axis of movement followed by a transport vehicle transfer arm. Mizokawa discloses a transport chamber adjacent to substrate holding modules A-M and other modules X-Z. A transport vehicle moves substrate into said modules along a linear travel path. Mizokawa discloses linear travel paths between transport chamber walls. It is unclear from applicant's claims whether the travel paths from a particular chamber wall or whether the travel paths are intended to merely occur within a transport chamber.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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